

Barr, M. (2016) Using Video Games to Develop Communication Skills in Higher Education. In: Proceedings of the Irish Conference on Game-Based Learning, Trinity College Dublin, Ireland, 1-2 Sept 2016

CHAPTER X (TO BE MODIFIED BY THE EDITOR)

USING VIDEO GAMES TO DEVELOP COMMUNICATION SKILLS IN HIGHER EDUCATION

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Introduction

Employers are increasingly concerned that university graduates possess the transferable skills – sometimes termed ‘graduate attributes’ (Barrie, 2006) – necessary to succeed in the workplace. Prominent among these skills are those which relate to communication; however, not all higher education courses are designed explicitly to teach or develop such skills. Many commercial video games, on the other hand, require players to communicate in order to succeed, particularly in an era of increasingly ubiquitous online multiplayer games.

The pilot project described here sought to explore the use of commercial video games to teach communication skills in a formal higher education environment. If the idea appears practicable, this pilot could inform the development of self-directed game-based activities that students may undertake without intervention from already over-committed (and costly) academic staff. As such, the study aimed to begin to address the problem of how desirable ‘soft skills’ such as communication competence may be developed in higher education.

Literature Review

While there is a growing body of work published on the use of commercial off-the-shelf (COTS) games for game-based learning

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(Squire's Video Games and Learning: Teaching Participatory Culture in the Digital Age, 2011, and Gee's What Video Games Have to Teach us About Learning and Literacy, 2007, are key texts), little has been written about video games and communication skill, or employability more generally.

Aside from a few notable exceptions, such as the work of Hainey *et al.* (2011) on the applicability of games' motivational properties in higher education (HE), university-level study is less well represented in the game-based learning literature. Whitton (2010) is currently the only book dedicated to the topic. Whitton presents a series of cases studies that illustrate both the use of existing COTS games such as *World of Warcraft* and the development of bespoke educational titles, and is cautiously optimistic about the usefulness of video games in HE.

Communication Measures

The literature revealed two suitable measures of communication ability: the Self-Perceived Communication Competence Scale (McCroskey & McCroskey, 1988) and the Communicative Adaptability Scale (Duran, 1992). Both are well-established empirical means of measuring self-reported communication abilities, and may be administered straightforwardly and without restriction in multiple-choice form.

The communication competence that the Self-Perceived Communication Competence Scale (SPCC) is intended to measure is defined by the authors as "adequate ability to pass along or give information; the ability to make known by talking or writing" (McCroskey & McCroskey, 1988). The scale comprises 12 items, intended to cover four common communication contexts (public speaking, one-to-one, in a small group and in a large group) with three common types of "receiver" (stranger, acquaintance and friend). For each combination of context and receiver, the respondent is asked to rate their communication competence on a scale of 1-100, where 100 is completely competent.

McCroskey & McCroskey's data indicated that their college student respondents (N = 344) were most confident in their communication competency when talking to friends and in one-to-one contexts, as might be expected: one is usually more confident when speaking to a small group of friends than addressing a large group of strangers.

Duran's Communicative Adaptability Scale (1983; 1992) is another self-reported measure of communication ability, framed in terms of

communicative adaptability, which Duran defines as “the ability to perceive socio-interpersonal relationships and adapt one’s interaction goals and behaviours accordingly.” Such adaptability depends upon both “cognitive (ability to perceive) and behavioural (ability to adapt) skills”. The scale, as reproduced in Duran (1992), comprises 30 statements (e.g. “I feel nervous in social situations”) that relate to the six dimensions (Social Composure, Social Confirmation, Social Experience, Appropriate Disclosure, Articulation and Wit) of the “social communication repertoire”. Respondents are asked to indicate the degree to which each statement applies to them, on a scale from 1 (“never true of me”) to 5 (“always true of me”) and the responses summed for each dimension. Certain responses (e.g. “I sometimes use words incorrectly”) are reversed before summing, e.g. a 2 becomes a 4.

In addition, the Rosenberg Self Esteem Scale (Rosenberg, 1979), General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) and Big Five Inventory (John *et al.*, 2008) were identified as measures that might gather data related to communication skill.

Methods

The pilot was conducted over eight weeks, with a small group (N = 6) of undergraduate student volunteers asked to complete psychometric tests relating to communication skill in weeks one and eight. In the intervening period, students were asked to play selected commercial video games, for two hours per week. Each week, students were given loosely-defined tasks to carry out using the specified game. Games that rely upon some form of communication were selected with input from a panel of academic and industry experts and included *Minecraft*, *Gone Home*, *Portal 2* and *Never Alone*. Lab activities closed with a short group discussion, and participants were encouraged to blog about their experiences.

Of the selected games, perhaps the most obvious inclusion was the cooperative portion of the critically-acclaimed *Portal 2*, wherein a pair of players must collaborate – and therefore communicate – in order to solve a series of spatial puzzles using their fictitious ‘portal guns’. From a practical point of view, the game supports split-screen play, meaning players may share the same PlayStation 3 (PS3) console and play together without an internet connection to the PlayStation Network (PSN). PSN traffic is currently prohibited by the host institution’s firewall configuration, such that multiplayer gaming that relies upon the PSN for

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connecting players is not possible – a scenario that may be faced at many higher education institutions.

Minecraft also facilitates split-screen cooperative play, albeit in a rather less structured form than that presented by *Portal 2*'s finely-honed collaborative puzzles. In *Minecraft*, players inhabit the same virtual world but the game offers no explicit objectives and does not require players to cooperate. Instead, players are free to work in tandem or in isolation to achieve goals of their own construction. Here, each pair was presented with a list of suggested collaborative tasks, for example: build a home that might house both players, or construct matching sets of armour. While the nature of the collaboration differed between the two games, similarities in the manner in which the players communicated within their pairs were observed. Invariably, the players that comprised each pair were – to some extent – mismatched in terms of their previous experience of playing the game at hand, and video games more generally. This mismatch encouraged behaviour that resembled peer tutoring (Topping, 1992) with the more experienced player assuming the role of tutor and the less experienced player acting as the tutee. This shared experience provided both players ample opportunity to exercise their communication skills, describing complex problems and solutions as and when they were encountered.



Figure 1: Split-screen cooperative play in *Minecraft*

Never Alone (Kisima Ingitchuna) was created by Upper One Games in collaboration with Alaskan Native storytellers and elders, drawing extensively on Alaskan Native lore. The game may be played cooperatively (one player assuming the role of a native girl and the other an Alaskan fox), requiring effective communication between players as they traverse the Alaskan landscape together. Most participants found the game engaging and enlightening. However, while those who played cooperatively did communicate to some extent, they found that one character (the fox) had more to do, at least in the opening hour or so of the game. This meant that the player controlling the other character (the small girl) was less actively engaged in proceedings.

Finally, The Fullbright Company's *Gone Home* offered a different proposition. As a single-player experience, the game is not concerned with inter-player communication: rather, it could be argued, the game's developers are communicating directly – and unidirectionally – with the player to tell a story. A small proportion of participants were somewhat dismissive of the title's relative lack of traditionally game-like features, but the majority of players did become engrossed in the game's mysterious narrative. This situation is illustrative of another of the problems that can arise when using a prescribed game within a formal learning environment: not every game is to every player's taste. Squire (2011, p.117) for example, reported similar problems, where some proportion of the class in question wasn't interested in playing video games, or failed to see the educational value in doing so. The students involved here volunteered to take part in a game-based study and all had at least some interest in video games, meaning their experiences may not be typical of a wider student population.

Findings and Results

For each measure, the change in the associated test score was recorded, for each participant, over the course of the eight-week study. Mean values of both communication measures were observed to increase between testing sessions. 95% confidence intervals for change in mean communication scores did not cross zero, suggesting this was not a chance occurrence. While the lack of a control group means it is difficult to prove that the games played were the cause of gains in communication skill, this finding is consistent with such a hypothesis.

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Table 1: Summary of change in Communicative Adaptability Scale and Self-Perceived Communication Competence Scale scores

	Communicative Adaptability Scale	Self-Perceived Communication Competence Scale
Min	0.0	-4.42
Max	12.0	15.83
Median	7.5	12.08
Mean	7.3	9.61
95% confidence interval	2.5 to 12.2	1.57 to 17.65

In addition to the calculated confidence intervals, the correlation coefficients between each measure were calculated using Pearson's r . These correlations are summarised in Figure 2.

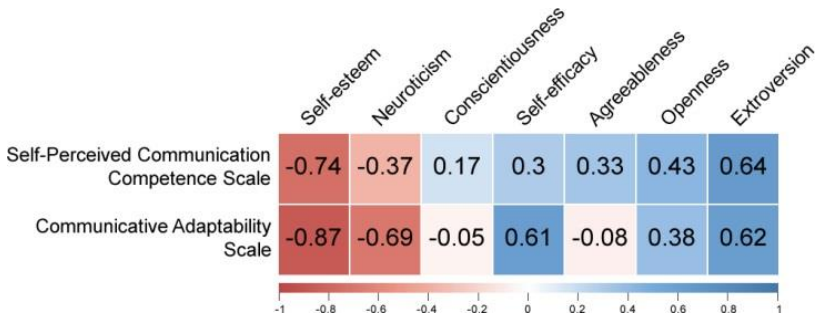


Figure 2: Correlogram of Pearson's r for test scores across both testing sessions

Correlation between the two communication measures was moderately strong ($r = 0.76$), which, as they are intended to measure aspects of the same attribute, indicates good validity. The Rosenberg Self-Esteem Scale produced some of the strongest correlations, showing moderately strong negative correlations with both communication measures (-0.74 for the Self-Perceived Communication Competence Scale and -0.87 for the Communicative Adaptability Scale). Whether or not these correlations are intuitive is debatable. It does follow, for example, that extroverts might find themselves to be capable communicators, in line with the moderately

strong positive correlation between extroversion and the two communication measures (0.64 and 0.62).

Collected data and a brief overview of methods employed may be found at: <http://dx.doi.org/>[full path removed to facilitate blind review]

Discussion

The pilot proved instructive and highlighted a number of challenges and concerns that must be addressed in any subsequent study. In the absence of a control group, it is unclear how much of the effect is a result of the intervention: students are expected to develop skills such as those related to communication as a result of their university experience. It may also be argued that aspects of the study itself – other than the playing of the games *per se* – may have exerted some influence. In particular, the brief post-game discussions, which were intended to provide the researcher with additional insight, may actually be viewed as part of the intervention, insofar as partaking in the discussion may have exercised participants' communication skills. The counter-argument here might be that it was the *games* on which discussion was predicated: it may be that some combination of gameplay and post-play discussion is the optimal means of improving communication skill with video games. In terms of written communication, the act of writing a blog post about the gaming experience – an option open to all our participants – might also be seen to exert an influence. However, only two of our participants were inspired to blog about the project (with one participant doing so on two occasions), so it is unlikely that this aspect of the project was significant.

A more robust approach to student recruitment must be taken if any study that builds on this work is to attract and maintain a large cohort of volunteers, and meaningful statistical analyses are to be performed on the data. Logistical concerns must also be addressed: a greater number of participants would place greater demands on limited hardware and software available for gaming sessions.

Technical issues encountered during the pilot were infrequent and relatively slight. Researchers were familiar with the chosen platforms (PC and PlayStation 3) and most of the games. Where there were unknown factors, such as the restrictions imposed by the university's IT infrastructure, extensive testing of configurations was undertaken in advance.

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Conclusion

The limited data described here appear to warrant further investigation. These data, coupled with informal feedback from student participants, suggest that commercial video games may have a role to play in developing communication skills in our graduates. Based on a small sample size, the pilot's highly promising results have motivated a further, hypothesis-testing, controlled study which is currently underway. This study – and any subsequent work – should address the limitations outlined here, with particular attention paid to controlling for other influences on participants' communication competence.

Guidelines

Aside from initial indications that games may help develop students' communication skill, this pilot provided some useful practical insight, which may be summarized as follows:

- There are logistical and resource-related issues associated with using games to develop skills in a formal learning environment on a larger scale. Communication implies multiplayer games, requiring multiple students to have access to gaming hardware and software simultaneously.
- Online multiplayer may provide a means of extending the capacity of such efforts, but institutional firewalls can hinder communication with players situated off-campus.
- The peer tutoring behavior observed here appeared to enrich the student experience. Similar projects should consider facilitating such behavior by, for example, pairing more experienced players with less experienced players.

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